U S WEST, Inc.
Suite 700
1020 Nineteenth Street, NW
Washington, DC 20036
202 429-3136
FAX 202 296-5157

Kenneth T. Cartmell
Executive Director - Federal Regulatory

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

September 24, 1999

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
The Portals, 445 Twelfth Street S.W.
Washington, D.C. 20554

      RE: CC Docket 96-45 and 97-160
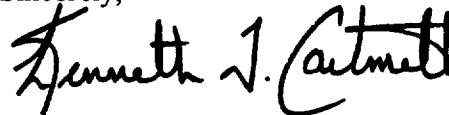   Cost Proxy Model Proceeding

Dear Ms. Salas:

On Friday, September 24, 1999, Peter Copeland, Melissa Newman, and I representing
US WEST, met with FCC Common Carrier Bureau staff members Katie King, Jeff
Prisbrey, Bob Loube, Bill Sharkey, Chuck Keller, William Wilcox and Todd Burmeister.
We discussed the Synthesis Model's (SM) code and internal logic, and presented an
alternative approach for computing Universal Service high cost funding. The attached
materials were presented during this meeting.

In accordance with Section 1.1206(a)(2) of the Commission's Rules and Regulations, the
original and three copies of this letter, will be filed with your office for inclusion in the
public record for the above-captioned proceedings. A courtesy copy of this letter will
also be sent directly to Katie King, Common Carrier Bureau, via messenger.
Acknowledgment of the date of receipt of this transmittal is requested. A duplicate of
this letter is provided for this purpose.

Please contact me if you have any questions.

Sincerely,

Kenneth T. Cartmell

cc: Katie King
        Peter Copeland, US WEST

UNIVERSAL SERVICE

FCC PRESENTATION
September 24, 1999

REASONABLENESS

- SM Results Are Unreasonable

- SM Logic Is Flawed

- SM Does Not Include Sufficient Facilities to Serve Demand

  - Equipment is Missing

  - Distances Are Understated

- Inputs For Material Prices and Expenses Are Understated

- Overall Effect is Understatement of Investment and Cost

REASONABLENESS

- ## One Phoenix, AZ Cluster Reports A Total Loop Investment of $27.60 Per Line

  - 2814 Total Lines (Violates Cluster Line Count Constraint)
  - Copper Cable Investment: $40,452 ($14.38/Line)
  - Fiber Cable Investment: $591 ($0.21/Line)
  - DLC Investment: $0
  - Drop Investment: $911 ($0.32/Line)
  - NID Investment: $790 ($0.28/Line)

    - Equals 20 NIDs @ $39.50 Each 3 Lines Per NID Equates To A Maximum Of 60 Lines Connected To A NID

  Figures Based on July 1999 PNR Data and June 2, 1999 FCC Model

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REASONABLENESS

- One Douglas, WY Cluster Reports An Average Loop Length Of 74 Miles Without An Optical Repeater

  - At Least 2,030 Clusters Covering 16,404 Lines In U S WEST Study Areas Report Feeder Greater Than 20 Miles

- SM Reports 6,539 Cluster In U S WEST Study Areas With Fiber Investment, But No DLC Investment

  - 9,983,126 Lines Covered By 6,539 Clusters
  - $136,209,344 Fiber Investment With $0 DLC Investment

Figures Based on July 1999 PNR Data and June 2, 1999 FCC Model

LINE COUNT ERRORS

- ## SM Does Not Use Actual Line Counts
  - Line Counts From PNR Proprietary Model
  - Actual Data Provided By U S WEST in Sept. '97 and Sept. '99
  - Actual Line Counts More Accurately Portray Cost

- ## SM Creates Incorrect Special Access Lines
  - Derived Channel Counts Used Instead of Facility Counts
  - Channels Not Related to Cost
  - Use of Channels Overstates Economies of Scale and Understates Cost

LINE COUNT ERRORS

- ## PNR Data Contains Fractional Lines

Wc_code,SwX,SwY,CenX,CenY,Company
DNVRCOCP,-104.984000,39.755585,-104.984000,39.755585,US WEST COMMUNICATIONS -
MOUNTAIN BELL - CO
Number of Lines: **_95302.15_**
Number of Clusters: 40
Run-time in Minutes: 0.4027

Cluster, X, Y, Lines, X1, Y1, X2, Y2, Bedrock, Hardness, Soil, WaterTbl, MinSlope, MaxSlope, CBG
7,351,16375,930.2905,884,16375,-864,16377,47.76,HARD,GRV-SL,6,7.35,19.2,80010089521
X, Y, Cluster

270,15801,7,**_0.8441238_**,0
270,15817,7,**_0.8441238_**,0
270,15834,7,**_0_**,1
270,15851,7,**_0_**,1

- ## Error Exists For All .in and .clu Files Examined

LINE COUNT ERRORS

- Negative Count Of Non-Primary Residential Lines

  - SM Density Zone Report Format

  - All But 2 U S WEST Study Areas Report Negative Secondary Residential Line Counts

  - Possibly Caused By Assuming Each Household Has A Primary Line

Based on July 1999 PNR Data and June 2, 1999 FCC Model

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INPUT ERRORS

- The FCC's Plant Mix Is Not Reasonable Compared to State Findings in UNE and USF Cost Dockets

FCC Plant Mix

Density	UG	Buried	Aerial
0	0.00%	60.00%	40.00%
5	1.00%	62.00%	37.00%
100	2.00%	68.00%	30.00%
200	4.00%	66.00%	30.00%
650	8.00%	62.00%	30.00%
850	20.00%	50.00%	30.00%
2550	40.00%	30.00%	30.00%
5000	60.00%	10.00%	30.00%
10000	90.00%	0.00%	10.00%

NE Plant Mix

Density	UG	Buried	Aerial
0	5.00%	90.00%	5.00%
5	5.00%	90.00%	5.00%
100	15.00%	83.00%	2.00%
200	15.00%	83.00%	2.00%
650	15.00%	83.00%	2.00%
850	80.00%	20.00%	0.00%
2550	85.00%	15.00%	0.00%
5000	85.00%	15.00%	0.00%
10000	100.00%	0.00%	0.00%

IA Plant Mix

Density	UG	Buried	Aerial
0	0.00%	99.00%	1.00%
5	0.00%	99.00%	1.00%
100	0.00%	93.00%	7.00%
200	8.00%	85.00%	7.00%
650	8.00%	85.00%	7.00%
850	8.00%	85.00%	7.00%
2550	8.00%	85.00%	7.00%
5000	8.00%	85.00%	7.00%
10000	8.00%	85.00%	7.00%

MN Plant Mix

Density	UG	Buried	Aerial
0	5.00%	79.00%	16.00%
5	7.00%	81.00%	12.00%
100	10.00%	83.00%	7.00%
200	12.00%	83.00%	5.00%
650	13.00%	84.00%	3.00%
850	13.00%	85.00%	2.00%
2550	14.00%	85.00%	1.00%
5000	15.00%	84.00%	1.00%
10000	16.00%	84.00%	0.00%

INPUT ERRORS

- Flawed Statistical Methods For Cable & Structure
  - Cable Regression Models Inconsistent Between Cable Types
  - Negative Marginal Costs For Cables Greater Than 1800 Pairs
  - Elimination Of Significant Data Observations
  - Placement Costs Based On Unreasonable Extrapolation
  - RUS Data Contains Insufficient Information
  - Mixing and Matching Data from Different Studies
    - Large Ex-Post Cost Adjustments
    - Sharing Information Already Included in Original Data

INPUT ERRORS

- Expense Regression Problems
  - Highly Correlated Explanatory Variables
  - Numerous Adjustments to Regression Results
  - Elimination of Select Independent Variables
  - Attribution of Causation to Independent Variables
  - Instability of Regression Results

PROGRAMMING ERRORS

- ## Pascal Code Is Untraceable

```pascal
procedure SpanTree( dmtx    : d8000x8000_ptr; { distance matrix for nodes }
            n        : integer;    { dimension }
            var
            _from    : i8000_ptr;    { list of lots, with #1 = SAI }
            var
            b        : i8000_ptr;    { lot that each node points to }
            var
            d1       : d8000_ptr     { distance from each lot to next node }
            );

const dlarge = 999999999.9;
var
  i,j,k    : integer;
  l        : integer;
  a        : b8000_ptr;
  min      : double;
  dist     : double;
  dist2    : double;

begin
  new(a);

  for i := 1 to n do
  begin
    a^[i] := true;
    b^[i] := 0;
    d1^[i] := dlarge;
  end;

  a^[1] := false;
  j := 1;

  for i := 2 to n do
  begin
    min := dlarge;
    for k := 2 to n do
    begin
      if (k <> j) then
      if a^[k] then
      begin
        dist := dmtx^[j]^[k];

        if dist < d1^[k] then
        begin
          d1^[k] := dist;
          b^[k]  := j;
        end;

        if min > d1^[k] then
        begin
          min := d1^[k];
          l := k;
        end;
      end; { if a[k] }
    end; { for k }
    j := 1;
    a^[j] := false;
  end; { for i }
```

PROGRAMMING ERRORS

- Cluster Line Count Constraints

  – Maximum of 1,800 Lines Per Cluster

- Chandler, AZ Has A Cluster With 18,931 Lines

- In U S WEST Territory, 993 Clusters and 448,530 Lines Violate The Constraint

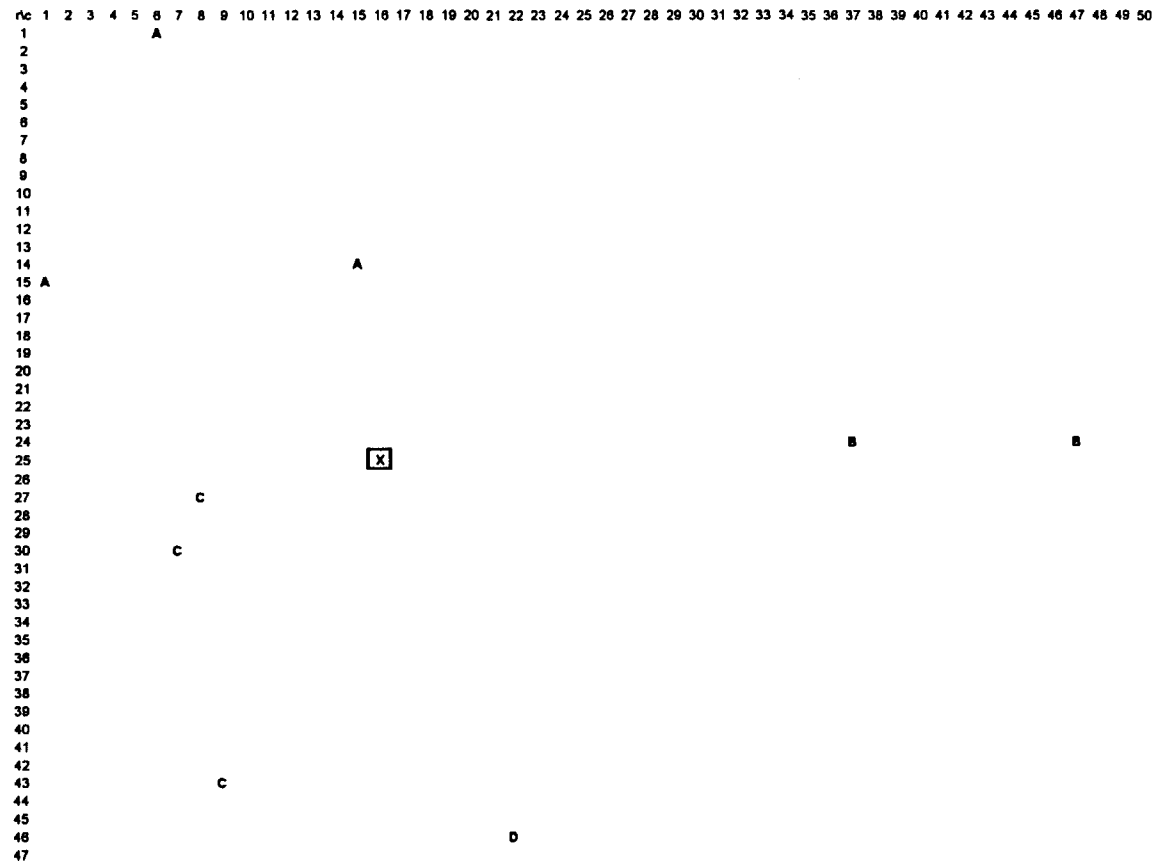Figures Based on July 1999 PNR Data and June 2, 1999 FCC Model

PROGRAMMING ERRORS

SM Fails To Model Sufficient Facilities to Serve Customer Locations in Urban Areas

Res Pts	Bus Pts	Total Pts	Lots	EW_ Lots	NS_ Lots	Total Lots	Res Lines	Bus Lines	Total Lines	Lines Per Lot	nid cost	calculated drop length (kf)	drop length (kf)	drop cost	Corrected Nid Cost for Grid	Corrected Drop Cost	Cluster Cost Understatement
1	25	26	31	4	8	32	1	2,750	2,751	85.97	$1,264.00	0.0364	0.0364	$652	$36,656.00	$2,994	
0	2	2	0	1	1	1	-	4	4	4.00	$39.50	0.2173	0.2173	$122	$79.00	$243	
11	1	12	11	4	3	12	11	1	12	1.00	$474.00	0.0675	0.0675	$454	$474.00		
12	4	16	12	4	3	12	12	4	16	1.33	$474.00	0.0675	0.0675	$454	$474.00		
3	0	3	3	3	1	3	3	-	3	1.00	$118.50	0.1849	0.1849	$311	$118.50		
0	48	48	56	8	7	56	-	5,174	5,174	92.39	$2,212.00	0.0299	0.0299	$939	$68,572.00	$4,309	
1	1	2	0	1	1	1	-	1	1	1.00	$39.50	0.2173	0.2173	$122	$39.50		
2	1	3	2	2	1	2	2	1	3	1.50	$79.00	0.1906	0.1906	$213	$79.00		
13	4	17	13	5	3	15	13	4	17	1.13	$592.50	0.0650	0.0650	$546	$592.50		
4	0	4	4	2	2	4	4	-	4	1.00	$158.00	0.1086	0.1086	$243	$158.00		
											$5,451.00			$4,055	$107,242.50	$7,547	$ (105,282.80)

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PROGRAMMING ERRORS

- SM Fails To Build Adequate Distribution

  - Total Distribution Should, At Minimum, Be Greater Than The Rectilinear Distance Between The Two Farthest Customer Locations (Max V&H)

- In WY Workfile "HMWKWY5051089999," The SM Under-Builds Distribution By Up To 6,421 Feet, Or 53%

PROGRAMMING ERRORS

```
r/c  1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
 1                   A
 2
 3
 4
 5
 6
 7
 8
 9
10
11
12
13
14                                      A
15  A
16
17
18
19
20
21
22
23
24                                                                      B                         B
25                                  [X]
26
27            C
28
29
30        C
31
32
33
34
35
36
37
38
39
40
41
42
43        C
44
45
46                        D
47
```

PROGRAMMING ERRORS

Cluster Number	Customer Points	Max V & H	SM Distribution Distance	Percent Difference
42	9	40,103	24,796	(38%)
53	1	0	0	0
56	2	12,061	5,640	(53%)

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PROGRAMMING ERRORS

- SM Reports Costs In Two Formats: Wire Center And Density Zone

- Different Cost Results For Each Format
  - Colorado Example
    - Wire Center: $20.04 Total Monthly Cost Per Line
    - Density Zone: $20.19 Total Monthly Cost Per Line

- Error Exists In All U S WEST Study Areas

SIMPLIFIED METHODOLOGY

- U S WEST Proposes A Simpler Method For Estimating Cost To Serve High Cost Customers

- New Methodology Solves Several Problems

  - Customer Location

  - Irrational Model Results (Outliers)

  - Removes Political Controversy Caused by SM and Its Flawed Representation of Cost

SIMPLIFIED METHODOLOGY

- ## Three Step Process
  - Set a Politically Acceptable, Sufficient Fund Size
    - Compare the Number of Low Density Customers Served by the Non-Rural LECs Compared to the Rural LECs and Size Fund Based on Ratio to Current Rural Fund
    - Size Fund Similar to Schools and Libraries
    - Compare Estimates of HAI, BCPM, SM
  - Use Geographic Data to Determine High Cost Areas Using a Density Screen (e.g. Areas < 50 Lines/Square Mile)

SIMPLIFIED METHODOLOGY

- **Three Step Process (Continued)**

    – Equitable Distribution of the Pre-Set Fund Amount
      - How Do you Divide a Fund Equitably?

    – Use a Simplified Equation That Fairly Represents the Correlation Between Density, Distance, and Cost.

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SIMPLIFIED METHODOLOGY

- Estimated Forward Looking Universal Service Cost Relationship Is Generated By A Simple Equation

  - Fewer Outlier Results
  - Faster Calculation
  - More Accurate Rural Costs

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SIMPLIFIED METHODOLOGY

- Based On Regression Of Existing Cost Model Results, Such As BCPM

- Uses Relationship Between Distance And Density With Cost To Serve

- Requires Exact Customer Location Data For All Locations Receiving Support

SIMPLIFIED METHODOLOGY

- Each ETC Must Provide The Following Information For Each Supported Customer
  - Exact Service Address In Lat, Lon Format
  - Density In Customers Per Square Mile Format
  - Serving Wire Center And Its Location

CONCLUSION

- The Synthesis Model Remains Engrossed In Serious Flaws

  – Flawed Customer Location Data

  – Flawed Algorithms, Optimizations, Code Logic

  – Flawed Inputs

- U S WEST Recommends That The FCC Abandon The SM And Adopt A Simpler, More Accurate And Fair Methodology To Provide Sufficient Funding And Properly Target USF